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10/560,574

04/12/2006

Ken Umeno

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EXAMINER

PATHAK, SUDHANSHU C

ART UNIT

PAPER NUMBER

2611

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|----------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/560,574 | Applicant(s) UMENO ET AL. | |
| | Examiner SUDHANSHU C. PATHAK | Art Unit 2611 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/12/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-22 are pending in the application.

Drawings

2. Figure 6 should be labeled with a legend such as "Prior Art" since that which is known is illustrated. Corrective Action is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-2, 4 (apparatus) & 7-8, 10 (method) are rejected under 35 U.S.C. 102(b) as being anticipated by McGillem et al. (A chaotic direct-sequence spread-spectrum communication system; IEEE Transactions on Communications; Volume: 42, Issue: 234; Page(s): 1524-1527; April 1994).

In regards to Claims 1, 4, 7 & 10, McGillem discloses a communicating apparatus (method) which makes spreading by multiplying transmission data by a chaos spreading code and transmits a spreading output (Fig. 4 & Abstract, lines 1-10), comprising: first and second spreading units (Fig. 4, elements "multiplier operators" & Abstract, lines 1-10) {Interpretation: The reference discloses a DS/SS system comprising chaotic spreading sequences thus spreading units are inherent. Furthermore, the reference in Fig. 4 discloses a plurality of spreading units for spreading data $\{b_{1...K}(t)\}$ with chaotic sequences $\{Aa_{1...K}(t)\cos(w_0t + \theta_k)\}$; and a

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transmitting unit to which output signals of said first and second spreading units are inputted (Fig. 4, element “ Σ ”) {Interpretation: The reference discloses a combiner to which output signals of said first and second spreading units are inputted and are transmitted}, wherein a first chaos spreading code which is inputted to said first spreading unit and a second chaos spreading code which is inputted to said second spreading unit orthogonally cross each other, that is, an absolute value of a normalized correlation coefficient of said first and second chaos spreading codes is equal to or less than 0.3 (Page 1525, left-column, lines 9-18) {Interpretation: The reference discloses the cross correlation is identically zero}.

In regards to Claims 2 & 8, McGillem discloses a communicating apparatus (method) which makes spreading by multiplying transmission data by a chaos spreading code and transmits a spreading output as described above. McGillem further discloses a sum of squares of amplitude values of said first and second chaos spreading codes is constant (Page 1525, left-column, lines 9-18) {Interpretation: The reference discloses the auto correlation is a delta function}.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 15 (apparatus) & 9, 20 (method) are rejected under 35 U.S.C. 103(a) as being unpatentable over McGillem et al. (A chaotic direct-sequence spread-

spectrum communication system; IEEE Transactions on Communications; Volume: 42, Issue: 234; Page(s): 1524-1527; April 1994) in view of Umeno et al. (2005/0033785).

In regards to Claims 3, 9, 15 & 20, McGillem discloses a communicating apparatus which makes spreading by multiplying transmission data by a chaos spreading code and transmits a spreading output as described above. McGillem further discloses first and second chaos spreading codes are formed by a chaos spreading code generator comprising: setting an initial value wherein the initial value is unique for each sequence (code) (Page 1525, right-column, lines 1-26 & Fig.'s 2-3) {Interpretation: The reference discloses an initial value " x_{00} "; a mapping unit for executing mapping once in which a map has been applied to the value that is outputted from said storing unit or for divisionally executing said mapping a plurality of number of times (Page 1525, right-column, lines 1-26 & Fig.'s 2-3) {Interpretation: The reference discloses chaotic maps " $C_1(x_n, r_1)$ "}. However, McGillem does not disclose storing the initial value in a storing unit; and executing chaos mapping based on a Chebyshev polynomial; and randomizing means for randomizing a least significant bit of an output of said mapping unit; and a path for outputting the output of said mapping unit including said randomized least significant bit, as said chaos spreading code, and returning said output to said storing unit.

Umeno discloses a method for generating a sequence by executing chaos mapping based on a Chebyshev polynomial (Paragraphs 2-6) including storing the initial value in a storing unit (Fig. 1, elements 103-104 & Fig. 2, elements S202,

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S203) and randomizing means for randomizing a least significant bit of an output of said mapping unit; and a path for outputting the output of said mapping unit including said randomized least significant bit (Fig. 2, element S206 & Paragraph 61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Umeno teaches storing the initial value in a storing unit; and executing chaos mapping based on a Chebyshev polynomial; and randomizing means for randomizing a least significant bit of an output of said mapping unit; and a path for outputting the output of said mapping unit including said randomized least significant bit, as said chaos spreading code, and returning said output to said storing unit and this is implemented in the apparatus as described in McGillem so as to be able to generate a chaos spreading code so as to obtain a truly random spreading code.

7. Claims 5-6, 13-14, 16-17 (apparatus) & 11-12, 18-19, 21-22 (method) are rejected under 35 U.S.C. 103(a) as being unpatentable over McGillem et al. (A chaotic direct-sequence spread-spectrum communication system; IEEE Transactions on Communications; Volume: 42, Issue: 234; Page(s): 1524-1527; April 1994).

In regards to Claims 5-6, 11-13, 18 & 21-22, McGillem discloses a communicating apparatus which makes spreading by multiplying transmission data by a chaos spreading code and transmits a spreading output as described above. McGillem further discloses said transmitting unit is a radio transmitting unit for adding the output signals of said first and second spreading units (Fig. 4, element

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“Σ”). McGillem further discloses a receiving apparatus for receiving transmission data constructed by first and second spreading outputs which have been spread by first and second chaos spreading codes, in which said first and second chaos spreading codes orthogonally cross each other, that is, an absolute value of a normalized correlation coefficient of said first and second chaos spreading codes is equal to or less than 0.3 (Fig. 4, element “RX” & Page 1525, right-column, lines 17-24). McGillem further discloses performing synchronization between the transmitter/receiver (Page 1525, right-column, lines 29-33 & Page 1526, left-column, lines 1-2). However, McGillem does not disclose up-converting an addition output into a predetermined carrier frequency, and transmitting an up-converted output from an antenna. However, it would have been obvious to one of ordinary skill in the art at the time of the invention that a spread spectrum communication includes an up-converter and transmitting the signal from an antenna. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention that a spread spectrum communication system includes an orthogonal I/Q modulation so as to increase the data rate of the system. However, McGillem does not explicitly disclose first and second inverse spreading units. However, it would have been obvious to one of ordinary skill in the art at the time of the invention that in a DS/SS system a receiver includes an inverse spreading unit.

In regards to Claims 14, 19, McGillem discloses a communicating apparatus which makes spreading by multiplying transmission data by a chaos spreading code and transmits a spreading output as described above. McGillem further discloses a

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communicating apparatus (method) which makes spreading by multiplying transmission data by a chaos spreading code and transmits a spreading output as described above. McGillem further discloses a sum of squares of amplitude values of said first and second chaos spreading codes is constant (Page 1525, left-column, lines 9-18) {Interpretation: The reference discloses the auto correlation is a delta function}. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that McGillem satisfies the limitation of the claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUDHANSHU C. PATHAK whose telephone number is (571)272-5509. The examiner can normally be reached on 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on 571-272-3042.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sudhanshu C Pathak/
Primary Examiner, Art Unit 2611